
US ATLAS Pixel Meeting

July 18-19, 2002

UC Santa Cruz

Meeting Agenda

July 18

0900 Introduction - Gil, Abe
0930 WBS 1.1.1.3 Electronics - Kevin
10:30 Break
11:00 WBS 1.1.1.2 Sensors - Sally
11:30 WBS 1.1.1.4 Optical hybrids - KK

12:15 Lunch

1;15 WBS 1.1.1.4 Flex Hybrids – Rusty, Pat
2:15 WBS 1.1.15 Modules - Maurice
3:00 WBS 1.1.1.1 Mechanics(I) - Gil
3:30 Break
4:00 WBS 1.1.1.1 Mechanics(II) – Neal, Eric
5:30 Contingency
6:00 Adjourn

July 19

09:00 WBS 1.1.1.6 - Beam Tests - Kevin
09:45 WBS 1.1.1.6 - System Tests - Maurice
10:30 Break
11:00 More on system testing
11:30 Contingency

12:00 Lunch

Overall

- Cost increases in a number of areas were identified and a few cost decreases. It's too early to have bottom line, but the overall cost relative to ETC02 is projected to increase. The next step is to take the information presented and enter into the ETC03 database. Gil
- Significant delays in most sub-elements were projected relative to the ETC02 schedule of only 8 months ago.
- As a result, the schedule is now extremely tight, assuming the pixel system is to be ready for installation in the pit by the end of 2005.
- The schedule for Management Contingency decisions is also delayed.

Current Milestones

		Baseline	ETC02	June	Current
	Name	Milestone	Milestone	Projection	Projection
	Outer Structure Complete/Ready for Modules	23-Sep-03	22-Sep-03	Aug-03	Aug-03
	Outer Structure Needed for Modules	7-Jan-04	15-Apr-04	May-04	May-04
	Support tube complete	***	18-Jun-04	Jun-04	Jun-04
	Support tube need date	***	***	Feb-05	Sep-04
	First production wafers delivered	18-Jan-02	24-May-02	Complete	Complete
	Sensors Testing Complete	3-Oct-03	26-Sep-03	Sep-03	Jan-04
Sil L2/6	1st IBM prototype submitted(FE-I1)	26-Jul-01	30-Nov-01	Complete	Complete
	2nd IBM prototype submitted(FE-I2)	19-Jun-02	26-Sep-02	Nov-02	Dec-02
Sil L2/7	Start IBM Production	13-Mar-03	12-Jun-03	Aug-03	Sep-03
	1st outer IBM wafers arrive	30-Jul-03	6-Nov-03	Nov-03	Dec-03
	Outer IBM FE Testing complete	14-Jul-04	21-Oct-04	Oct-04	Oct-04
	Flex Hybrid PRR	3-Jul-02	10-Oct-02	Oct-02	Oct-02
	Optical FDR	31-Jan-02	10-Oct-02	Oct-02	Feb-03
	Optical PRR	5-Mar-03	12-Jun-03	Jun-03	Sep-03
	First outer flex available for module assembly	12-Feb-03	22-May-03	May-03	May-03
	Need date for first outer flex	20-Nov-03	27-Feb-04	Feb-04	?
	Bare module PRR	26-Jun-02	10-Oct-02	Dec-02	Dec-02
	Module assembly FDR	26-Jun-02	10-Oct-02	Dec-02	Dec-02
	Module assembly PRR	28-May-03	4-Sep-03	Jun-03	Jun-03
Sil L2/8	Start IBM outer bare module production	22-Oct-03	29-Jan-04	Jan-04	Feb-04
	Complete testing disk sectors	4-Aug-04	11-Nov-04	Jan-05	Feb-05
Sil L2/9; S	Disk System at CERN(and other items)	13-Oct-04	20-Jan-05	Mar-05	Apr-05
	Start pixel installation in experiment	15-Apr-05	24-Feb-05	Feb-06	Feb-06

MC Milestones

	Old	New			
Bare flex production	Jul-02	Jan-03			
Flex components/assembly	Jul-02	Jan-03			
FE Production	Mar-03	Aug-03			
Optical hybrids	Mar-03	Sep-03			
Optoelectronics production	Mar-03	Sep-03			
B-layer production		n/a	Only one FE order now		
FE IC die sort	Jun-03	Aug-03			

1.1.1.1 Mechanics

- Substantial delays in sector fabrication, laser welding not yet established. Mitigate cost increase by better phasing with other mechanics tasks to optimally utilize manpower and/or drop some fabrication so that only 2-hit system is possible. Gil
- PST schedule does not have much float. Production must start early 2003 to meet schedule. Eric, Neal, Gil
- Responsibilities for PST heater power supplies and DCS not clear. US cannot take on this design responsibility. Gil, Kevin
- Schedule for delivery of beam pipe support needs clarification. Currently delivered with rest of US items in early 2005. Eric
- Scrub cost estimate shown for beam pipe support. Request FY03 design funds by August '02. Plan on review of design, leading to go ahead for full prototype construction, in December '02. Gil, Eric
- Cost of service panels, particularly soldering of wires, has apparently increased significantly. There are also uncertainties in responsibilities for internal piping. Can the cost be reduced? Maurice, Eric
- Need overview of manpower by major task by quarter. Does the bottoms up estimate fit with constant manpower? Gil

1.1.1.2 Sensors

- CIS yield has become zero for unknown reasons. Tesla by far not yet qualified. Delay.
- Tesla proposed delivery schedule of 75 weeks after go ahead for production is too long. Earliest go ahead is October '02. This puts end of testing into May '04 at the earliest, too late. Either Tesla delivery rate increased or cut Tesla order.
- Limit US contribution to sensor procurement to FY03. None in FY04. This has implications for 2 vs 3 hits. Gil
- Using production sensors to jump start module program, means more sensors needed. Estimate. Maurice, Sally
- Update US costs with current exchange rate, and re-estimate contingencies. Sally
- Testing likely to continue into 1st quarter FY04.

1.1.1.3 Electronics

- Clear plan to proceed to FE-I2.
- MCC plan is not as clear. SEU fixes? System implications?
- Concerns about SEU in PINs. Measure in August? KK
- No time for changing design to have B-layer chip and meet end 2005 ready-for-installation deadline. B-layer chip is upgrade, need funding for this in FY04. Abe, Gil, Kevin
- FE production start by September '03 is only feasible if changes from FE-I2 are none or “minimal”. Does this imply we plan to use FE-I2 for starting production, even if only as spares for losses during sector and stave assembly? Implications for flex production, module assembly? What are we going to do with 48 FE-I2 wafers? Implications for MCC? Maurice, Rusty, Einsweiler.

1.1.1.4 Flex Hybrids

- Change flex design to decouple bias grid connection? All concerned
- How to structure flex fabrication contract given that flexes are ahead of electronics(unless FE-I2 is “production”)? Rusty
- How to pay for flex PCB? Gil
- Assume Dyconex for production? Will we know by August?
- Send Dyconex to LBL for quick irradiation.

1.1.1.4 Optical Hybrids

- Data shown on VCSEL lifetimes after irradiation are worrying. Radiation tests are very high priority. Higher priority than moving to BeO boards. Gan
- Unless radiation tests this test beam cycle are definitive, will need more next summer, which means delay of PRR to September '03 and production in FY04. Also neutron and gamma irradiation, what?
- Optical responsibilities not clear. What is total cost of all optoboards, update. Gan. What is BOC cost? Kevin
- What is logical division? All optoboards in US? Wuppertal BOC and related? What does Siegen do? Need proposal for October pixel week. KK, Kevin, Gil
- Addition of 100kCHF for fibers from US requested. Already looking at cost increases in this area without this addition.

1.1.1.5 Modules

- Model has evolved to only disk modules in US. Schedule for assembling disk modules for 2-hit system works assuming parts delivered, particularly bare modules.
- Drop bare module probing in US in production. Must be done in EU to meet schedule and if chip replacement is to be done on bare modules.
- AMS wafer thinning not yet in hand.
- HV operation confidence not in hand. Impact on flex PRR? Maurice, Rusty.
- Start work on burn-in system already in FY03 with FE-I1 and later FE-I2 modules.

1.1.1.6 Test Beam/System Test

- Test beam costs in FY02 exceeded funds available. Required off-base manpower to meet schedule, box more complicated.
- DAQ problems this year remain to be solved.
- Test beam in 2003 desires RODs. Implications for pixel ROD schedule? Kevin, Abe
- Break out system test costs here. This will be considerable increase above ETC02 estimate.
- System test in FY03 to be done at LBL in time to verify production readiness of FE.
- Scope of system test in FY04 not clear. Interaction with disk testing, preparations for testing at CERN, test beam... Maurice, Kevin, John R.

Bottom Line?

- Take some risks to meet installation date in pit of early 2006.
- Assume FE-I2 is production quality, proceed with module fabrication and testing as soon as FE-I2 wafers are probed successfully. Emphasis on disk module production.
- Parallel path to verify FE-I2 design and submit rest of production by September 2003.
- Take the other 40 some wafers and begin real production, with production flex, module assembly and test processes.
- If lucky, then FE-I3 order is rest of production, about 85%
- If not lucky, then have brought flex and module assembly to real readiness.
- Problems: Is MCC ready from FE-I2(same issue as FE-I2). Using production sensors, may need more. Bump bonding costs.